

REMARKS

At the time of the Office Action dated November 17, 2008, claims 1, 3-13, and 15-22 were pending in this application. In this Amendment, claims 1, 4, 13, and 16 have been amended, and claims 5 and 17 have been cancelled. Care has been exercised to avoid the introduction of new matter. Support for the amendments to claims 1 and 13 regarding the limitation of the paste electrode can be found in, for example, Fig. 12 and relevant description of the specification. Claims 1, 4, 13, and 16 have also been amended to address an antecedent basis issue raised by the Examiner. In addition, claim 1 has been amended to replace the limitation “at least 60 percent by weight” with --at least about 60 percent by weight--. Support for this revision to claim 1 can be found in original claim 1.

Claims 1, 3, 4, 6-13, 15, 16, and 18-22 are now active in this application, of which claims 1 and 13 are independent.

Claim Rejections—35 U.S.C. § 112

Claims 4 and 16 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner indicated that there is insufficient antecedent basis for the limitation “said first conductivity type crystalline semiconductor layer” of claims 4 and 16.

In response, claims 4 and 16 have been amended as set forth above in the manner suggested by the Examiner. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

Claim Rejections—35 U.S.C. § 103

1. Claims 1, 3-8, 10-11, 13, 15-19, and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata et al. (U.S. Patent Publication No. 2001/0008295, hereinafter “Sakata”) in view of Kloppel et al. (U.S. Patent Publication No. 2003/0170449, hereinafter “Kloppel”) and further in view of Kataoka et al. (U.S. Patent No. 6,133,522, hereinafter “Kataoka”).

In the statement of the rejection in paragraph 4 of the Office Action, the Examiner asserted that the applied combination of Sakata, Kloppel, and Kataoka teaches the claimed subject matter. In more detail, the Examiner admitted that Sakata does not teach, among other things, “the paste electrode contains at least 60 percent by weight and not more than 100 percent by weight of epoxy resin” (see the first full paragraph on page 4 of the Office Action). However, the Examiner, referring to column 9, lines 10-29 of Kataoka, asserted that the reference teaches “the silver collector electrode in a form of paste electrode of silver and a resin material (epoxy),” and “[t]he resin material can contain **100% epoxy resin**, therefore it meets the limitation of ‘at least about 60 percent by weight and not more than about 100 percent by weight of epoxy resin’” (the paragraph bridging pages 4 and 5 of the Office Action) (emphasis added).

However, Applicants submit that Sakata, Kloppel, and Kataoka, individually or in combination, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1, as amended. Specifically, the applied combination does not teach, among other things, “a paste electrode formed on the transparent oxide film, wherein the paste electrode contains at least about 60 percent by weight and not more than **about 80 percent by weight of epoxy resin**,” as recited in claim 1 (emphasis added).

Claim 1 has been amended to clarify that the upper limit of the claimed range regarding the epoxy resin in the paste electrode is not more than about 80 percent by weight. Even if the Examiner's assertion that Kataoka's resin material can contain 100% epoxy resin, is assumed

proper only for the sake of this response, none of the cited prior art references teach, among other things, “the paste electrode contains at least about 60 percent by weight and not more than about 80 percent by weight of epoxy resin,” as recited in claim 1.

As indicated above, support for the limitations “about 80 percent by weight” can be found in Fig. 12 of the present application. Fig. 12 shows the relationship between normalized tab strength and content of an epoxy resin in the paste electrode. The normalized tab strength values are obtained when the paste electrode contains (1) 30 percent by weight of the epoxy resin (a reference value of the normalized tab strength), (2) 50 percent by weight of the epoxy resin, (3) 60 percent by weight of the epoxy resin, (4) 80 percent by weight of the epoxy resin, and (5) 100 percent by weight of the epoxy resin. The “80 percent by weight” is one of the experimental results which were actually obtained, and the “80 percent by weight” corresponds to the data point indicating the maximum content of the epoxy resin except for 100 percent by weight, in the experiment results to obtain the graph of Fig. 12.

Based on the foregoing, Sakata, Kloppel, and Kataoka, individually or in combination, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. The above discussion is applicable to independent claim 13 reciting “resin material containing at least about 60 percent by weight and not more than about 80 percent by weight of epoxy resin.” Dependent claims 3, 4, 6-8, 10, 11, 15, 16, 18, 19, and 21 are also patentably distinguishable over Sakata, Kloppel, and Kataoka at least because these claims respectively include all the limitations recited in independent claim 1 and 13. It is noted that the rejection of claims 5 and 17 has been rendered moot by the cancellation of those claims. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

2. Claims 9 and 20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view of Kloppel and Kataoka, and further in view Kitae et al. (U.S. Patent Publication No. 2001/0005053, hereinafter “Kitae”); and claims 12 and 22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view of Kloppel and Kataoka, and further in view of Morizane et al. (U.S. Patent Publication No. 2001/0045505, hereinafter “Morizane”).

Claims 9 and 12 depend on independent claim 1, and claims 20 and 22 depend on independent claim 13. Applicants thus incorporate herein the arguments made in response to the rejection of independent claims 1 and 13 under 35 U.S.C. § 103 for obviousness as predicated upon Sakata, Kloppel, and Kataoka. The Examiner’s additional comments and reference to Kitae and Morizane do not cure the deficiencies of the applied combination of Sakata, Kloppel, and Kataoka at least because Kitae and Morizane do not teach, among other things, “the paste electrode contains at least about 60 percent by weight and not more than about 80 percent by weight of epoxy resin,” as recited in, for example, claim 1. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

Conclusion

Accordingly, it is urged that the application is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner’s amendment, Examiner is requested to call Applicants’ attorney at the telephone number shown below.

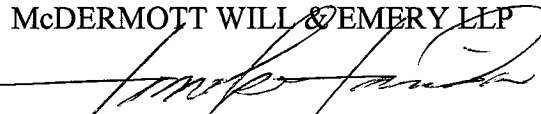
To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

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including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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